Experience And Challenges On Using The Central America Flash Flood Guidance In Costa Rica

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The Central America Flash Flood Guidance (CAFFG) early warning system has been operationally implemented at the National Meteorological Institute (IMN) since September 2004. The system relies basically on precipitation input data from real time satellite estimates obtained by the algoritm known as the Hydro-estimator developed by NESDIS, which runs in a server at the IMN since 2002. Issuing warnings and alerts for flash floods all over the country, a short range quantitative precipitation forecasts with lead times between 1 and 6 hours are also needed and is the only human intervention on the system. Mainly persistence and expert criteria based on the experience of local forecasters were initially considered to produce these estimates.

The validation of the CAFFG outputs, both in time and space, for the 2004 rainy season (summer) showed encouraging results for convective precipitation (cold top clouds), with approximately 65% hit rates for the occurrence of flash flooding, 35% false alarm rates and 4% miss rates. During the 2005 rainy season new tools were implemented, such as the Quantitative Precipitation Forecasts (QPF) from the Eta regional model at 10 km resolution, and results are also shown.

Among the conclusions, high quality short range precipitation forecasts are needed to improve the hit and false alarm ratios and the timeliness of the warnings and alerts. It is expected that using the QPF generated by others numerical weather prediction models running at the IMN, such as the MM5, will improve the outputs of the system. An algoritm to estimate precipitation from warm top clouds using real time satellite digital data is also necessary as an imput data for the system during the winter season. Finally, the cooperation and experience of countries working on short range forecasting would be important to improve the CAFFG, which could be implemented in other regions with similar characteristics and limitations, in order to save human lives and property.